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A New Species of *Crawfurdia* Wall. (*Gentianaceae*) from Arunachal Pradesh, India

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Crawfurdia arunachalensis S. S. Dash, R. Gogoi & A. A. Mao (*Gentianaceae*) is described from Arunachal Pradesh, India.

Key words : Arunachal Pradesh, *Crawfurdia arunachalensis*, *Gentianaceae*, new species.

During our routine identification in the Herbarium of the Botanical Survey of India, Arunachal Pradesh Regional Centre (ARUN), one unidentified specimen of *Crawfurdia* Wall. collected from Dzong area (Tawang district) of Arunachal Pradesh was found. On critical study of the specimen, along with available literature (Clarke 1879, Ho and Pringle 1995, Aitken 1999) and consultation of the other herbaria (ASSAM, BSHC, CAL), the specimen was found to be morphologically different from all the known species of the genus and hitherto undescribed. Hence it is described here as *Crawfurdia arunachalensis*, sp. nov. with a line drawing for easy identification (Figs. 1–2). Type image of *Crawfurdia campanulacea* Wall. & Griff. ex C. B. Clarke which is the closest allied species of *Crawfurdia arunachalensis* is reproduced with kind permission of the Director and the Board of Trustees, Royal Botanic Gardens, Kew, for a comparison (Fig. 3). A comparative account of the morphological characters with its allied species *Crawfurdia campanulacea* is also provided in Table 1.

Crawfurdia arunachalensis S. S. Dash, R. Gogoi & A. A. Mao, sp. nov. [Figs. 1–2]

Folia membranacea ovato-elliptica basi truncata, calycis lobi foliacei, corollae lobi 3–3.7 cm longi plicis truncatis, stamina in tubi parte inferiore inserta, antherae sagittata, fructus plene e corolla persistenti exserti, gynophora 2.5–3.5 cm longa, stipites 1.8–2.2 cm longa, seminis ala undulata.

Leaves membranous, ovate-elliptic, truncate at base, calyx lobes foliaceous, corolla lobes 3–3.7 cm long, plicae truncate, stamens inserted in the lower half of the corolla tube, anther sagittate, fruits completely exserted from the persistent corolla, gynophores 2.5–3.5 cm long, stipe 1.8–2.2 cm long, seed wing undulate.

Type: INDIA. Arunachal Pradesh: Tawang district, Dzong, 9 Sept. 2000, G. D. Pal 8599 (CAL–holotype; Fig. 1)

Twining perennials, stem smooth, spirally twisted, internodes 9–11.5 cm long, glabrous. Leaves opposite, membranous, ovate-elliptic or oblong elliptic, 3.2–4.7 × 1.5–2 cm, rounded or truncate at base, caudate acuminate at apex, serrate-denticulate at margin, minutely glandular ciliate, cilia reflexed; glabrous on both surfaces, minutely punctate on upper surface; basal nerves

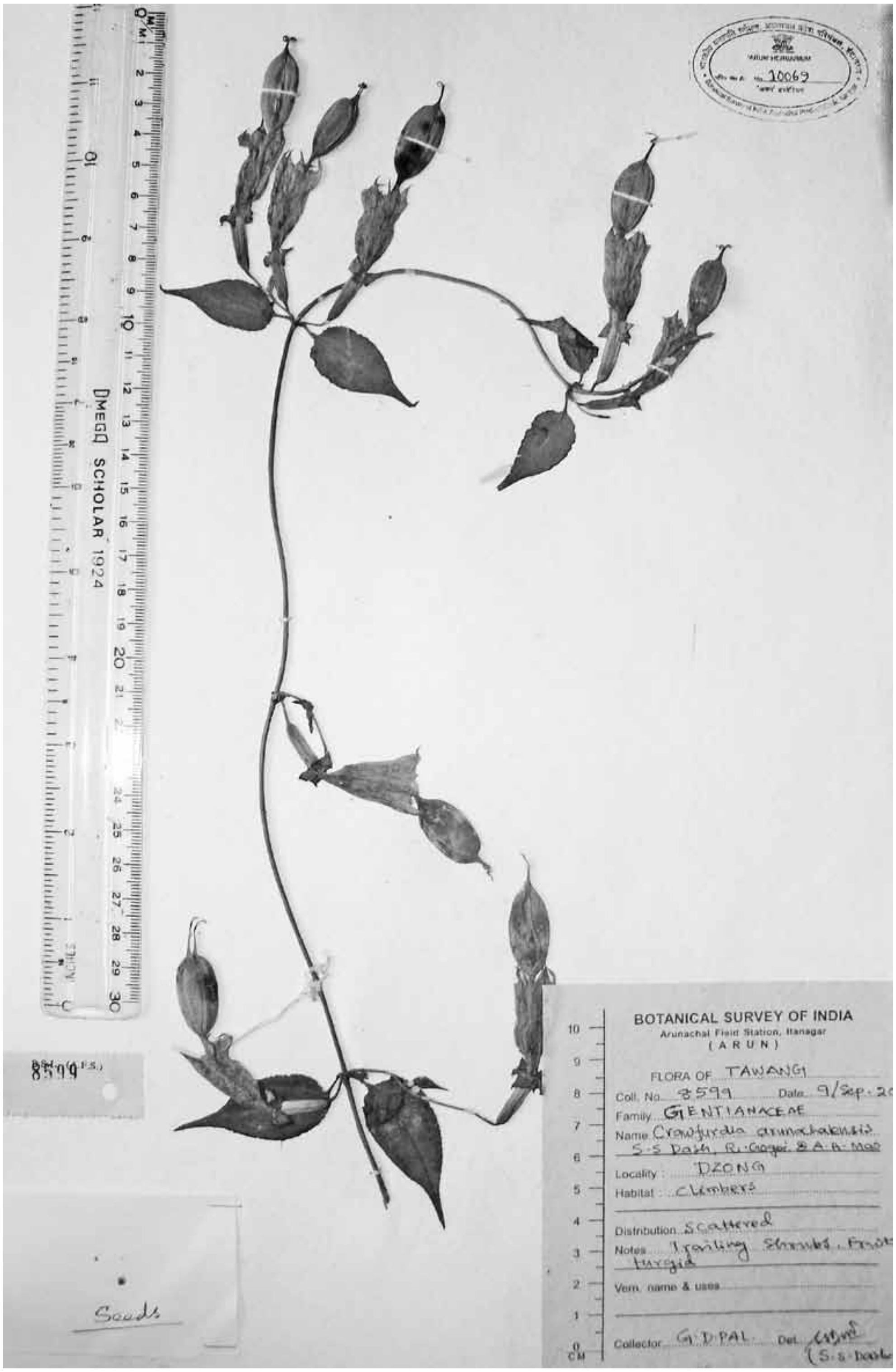
10069
8599
BOTANICAL SURVEY OF INDIA
Arunachal Field Station, Itanagar
(A R U N)
FLORA OF TAWANG
Coll. No. 8599 Date 9/Sep.
Family GENTIANACEAE
Name Crawfurdia arunachalensis S. S. Dash, R. Gogoi & A. A. Mao
Locality : DZONG
Habitat : Climbers
Distribution Scattered
Notes Trailing Shrubs. Fruit turgid
Vern. name & uses
Collector G. D. PAL Det.
(S. S. Dash
Seeds

Fig. 1. Type of *Crawfurdia arunachalensis* S. S. Dash, R. Gogoi & A. A. Mao, sp. nov. (G. D. Pal 8599, CAL).

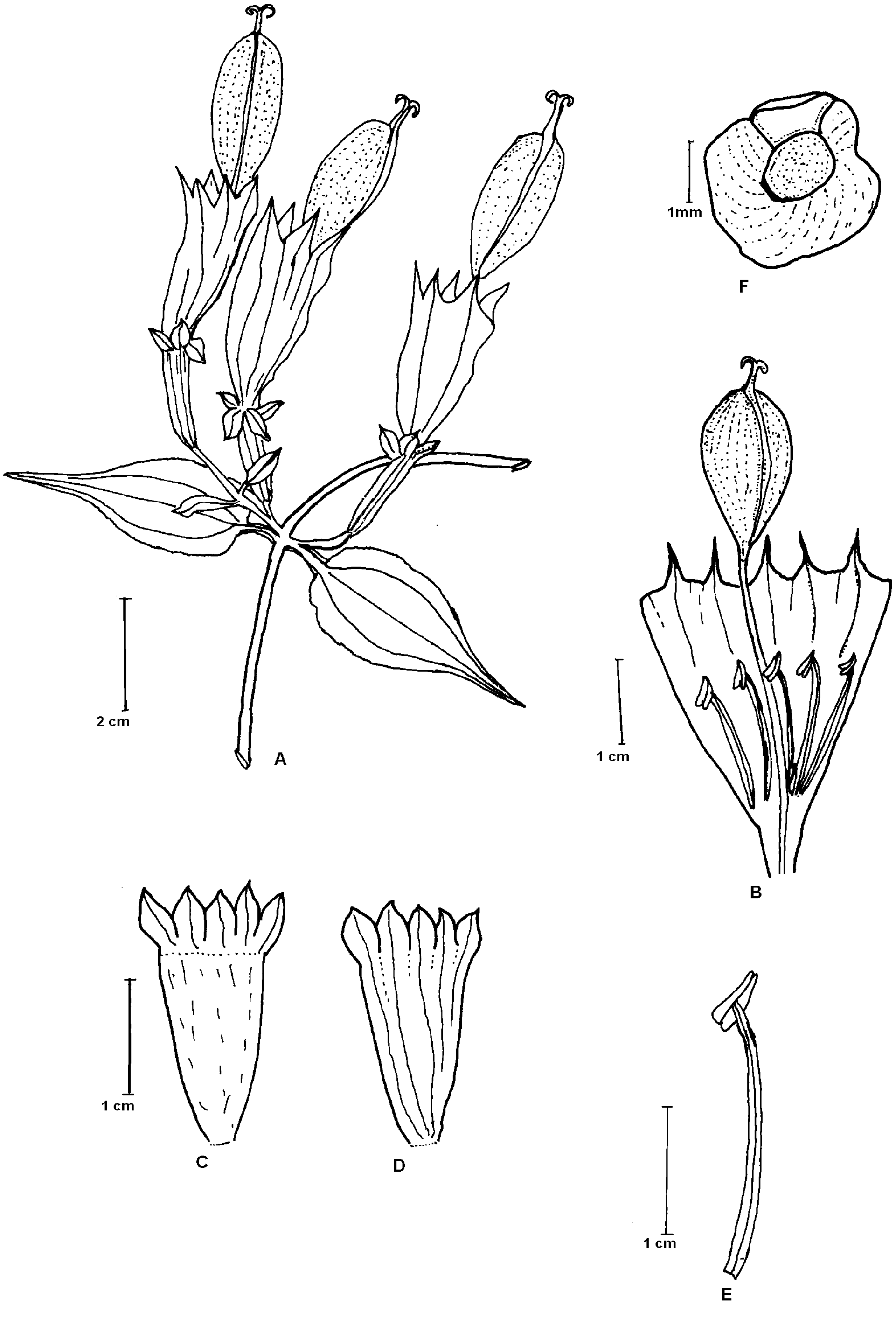

Fig. 2. *Crawfurdia arunachalensis* S. S. Dash, R. Gogoi & A. A. Mao (G. D. Pal 8599, CAL). A. Flowering branch. B. Opened corolla showing stamens and fruiting pedicel. C. Opened corolla (dorsal view). D. Opened corolla (ventral view). E. Stamen. F. Seed.

Table 1. Comparison of *Crawfurdia campanulacea* Wall. & Griff. ex C. B. Clarke and *C. arunachalensis* S. S. Dash, R. Gogoi & A. A. Mao in key morphological characters

	C. campanulacea	*C. arunachalensis*
Leaf	broadly ovate, 5–10 × 2–5 cm, coriaceous; 3–5-veined, crenulate or entire, margins not glandular ciliate	narrowly ovate-elliptic, 2.5–4.5 × 1.2–1.6 cm, membranous, only 3 veined, serrate-denticulate, minutely glandular ciliate at margin
Petiole	1–3 cm long	up to 1 cm long
Inflorescence	two flowered-cyme	usually 3 flowers on each node
Bracteole	usually absent, when present, minute	one pair of bracteoles present either at base or 1/3 of the length of the petiole
Calyx	1.2–1.7 cm long, tubular, lobes ovate, 5–10 × 5–6 mm, acute	1.7–2.2 cm long, tubular, lobes broadly ovate-triangular, 6–8 × 4–5 mm, acuminate
Corolla	tube 4–5 cm long, lobes ovate, apex acute, plicae semi-circular, rarely truncate	tube 3–3.7 cm long, lobes lanceolate, apex acuminate, plicae truncate
Stamen	filaments up to 1.5 cm long, anthers 4–5 mm long	filaments 2.2–2.5 cm long, anthers 1–1.5 mm long
Capsule	included or half exserted, compressed, gynophores 2–2.5 cm long, persistent style 0.3–0.6 cm long, stipe 0.8–1.3 cm long	completely exserted from the corolla, turgid, gynophores 2.5–3.7 cm long, persistent style 0.9–1.3 cm long, stipe 1.8–2.2 cm long
Seed	dark brown, discoid, length and breadth equal, ca. 1 mm in diameter, wing margins entire, with a flap shaped pouch (width-wise)	light brown, ellipsoid, length and breadth unequal, 1.5 × 1 mm, wing margin undulate, with a cupular pouch on the longitudinal side (length-wise)

3, not reaching to the margin, secondary veins reticulate, not conspicuous on upper surface, impressed beneath; petioles 0.3–0.7 cm long, minutely winged on lateral sides, petiole base narrowly broadened. Inflorescence axillary, 1–3-flowered at each node; pedicels 1–6 cm long; bracts foliaceous, present either at base or 1/3 length of the pedicels, pedicels terete, glabrous. Calyx tubular, tube 1.7–2.2 cm long, entire, glabrous, 5-lobed at apex; lobes broadly ovate, reflexed, 6–8 × 4–5 mm, acute at apex, entire at margin or minutely denticulate, basal portion connate to a copular limb. Corolla bluish, broadly campanulate, tube 3–3.7 cm long, lobes ovate-lanceolate, 3–5 × 2–3 mm, acuminate at apex, plicae truncate or slightly rounded, margin ciliate, glabrous. Stamens 5, inserted lower half of the corolla tube, filaments linear, erect, 2.2–2.5 cm long, all equal, glabrous, compressed; anthers sagittate, 1–1.5 mm long. Style 6–10 mm long, persistent in fruits, stigma bifid, often minutely coiled at apex. Fruits loculicidal capsules, oblong or ellipsoid, turgid, 2–2.8 × 0.8–1.4 cm, thickened along the sutures, completely exserted from the persistent corolla; gynophores 2.5–3.7 cm long, lower stipe of the elongated fruits, 1.8 – 2.2 cm. Seeds light brown, ovoid or ellipsoid, ca. 1 × 1.5 mm, broadly winged, wings ca. 1 mm broad, wings entire, shallowly undulate along the margin, a small cup shaped pouch present on the longitudinal side.

Flowering and Fruiting: July – September.

Habitat: An herbaceous twiner in the primary forest. Alt. 1750–2200 m.

IUCN conservation status: Not evaluated.

Distribution: India: Arunachal Pradesh, possibly endemic.

Etymology: The species is named after the state from where it is collected.

Notes: The species closely resembles to *Crawfurdia campanulacea* Wall. & Griff. ex C. B. Clarke (Fig. 3) by similar habit, presence

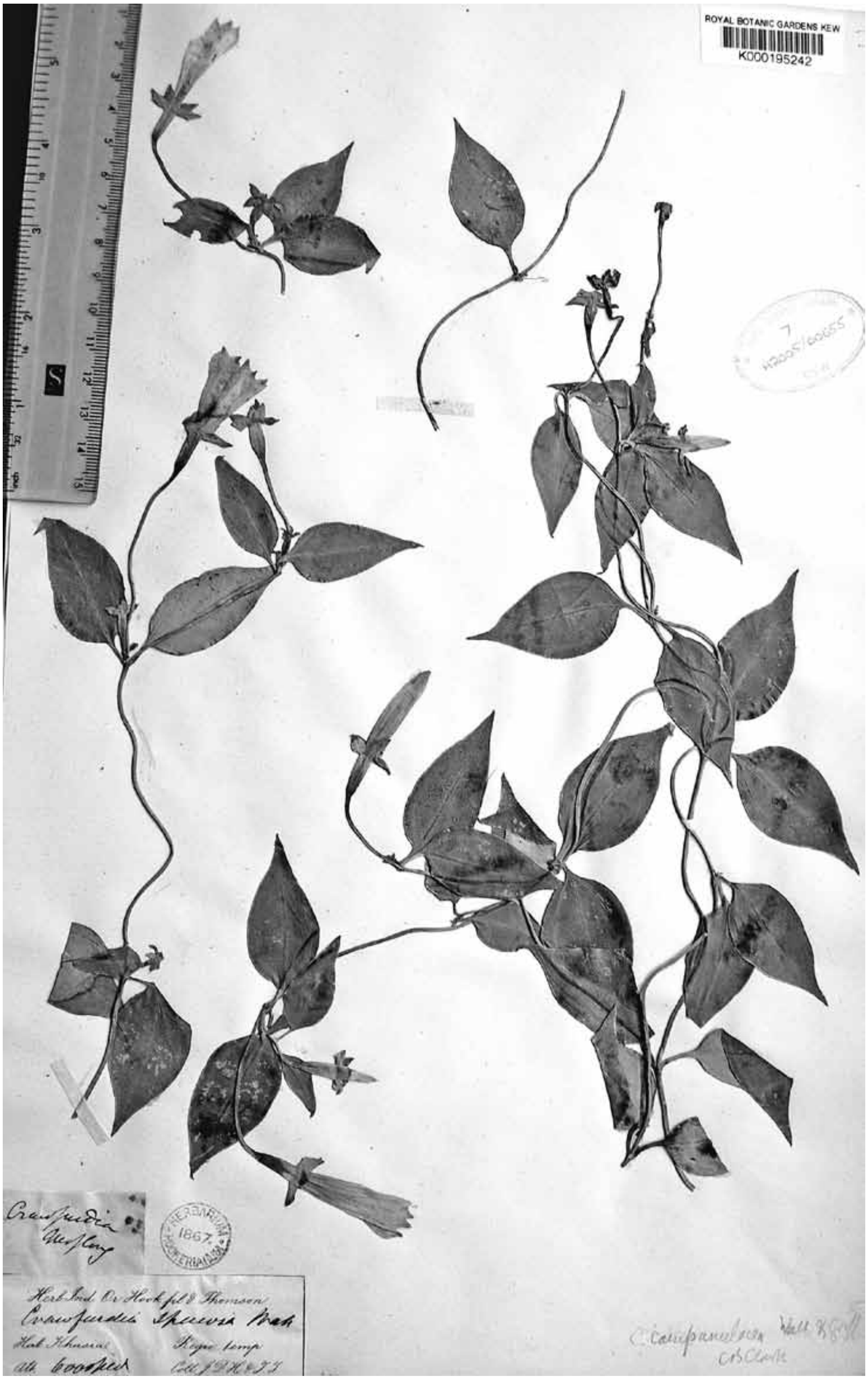
ROYAL BOTANIC GARDENS KEW
K000195242
HERBARIUM 1867
Herb. Ind. Or. Hook. fil. & Thomson
Crawfurdia speciosa Wall.
Hab. Khasia
Regio temp.
Coll. J.D.H. & T.T.
C. campanulacea Wall. & Griff.
C.B.Clarke

Fig. 3. Type of *Crawfurdia campanulacea* Wall. & Griff. ex C. B. Clarke (J. D. Hooker & T. Thomson s.n., K 195242).

of ovate calyx lobes, equal stamens, sagittate conditions of anthers. However, *Crawfurdia arunachalensis* can be differentiated from *C. campanulacea* by shorter pedicels, shorter corolla tube, truncate nature of the plicae, longer filaments, smaller anther, longer stipe and completely exserted fruits (Fig. 2). Comparative study of the key morphological characters is given in Table 1.

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S. S. Dash, R. Gogoi, A. A. Mao：**インド・アルナチャルプラデシュ州産 *Crawfurdia* 属（リンドウ科）の 1 新種**

インド・アルナチャルプラデシュ州からリンドウ科の1新種, *Crawfurdia arunachalensis* S. S. Dash, R. Gogoi & A. A. Mao を記載した. *Crawfurdia arunachalensis* は *C. campanulacea* Wall. & Griff. ex C. B. Clarke に似るが, 葉柄が短く, 花冠筒部が短く, 副片 plicae が切形で, 雄しべが長く, 葯が小さく, 朔果は柄が長く萼筒から完全に抽出する (Fig. 2B) 点で異なる. これら2種の形態的特徴における比較を Table 1 に示した.

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